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PHOTOGRAPHIC INTERPRETATION REPORT

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ZAOZERNYY ATOMIC ENERGY COMPLEX
ZAOZERNYY, USSR

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NOVEMBER 1966

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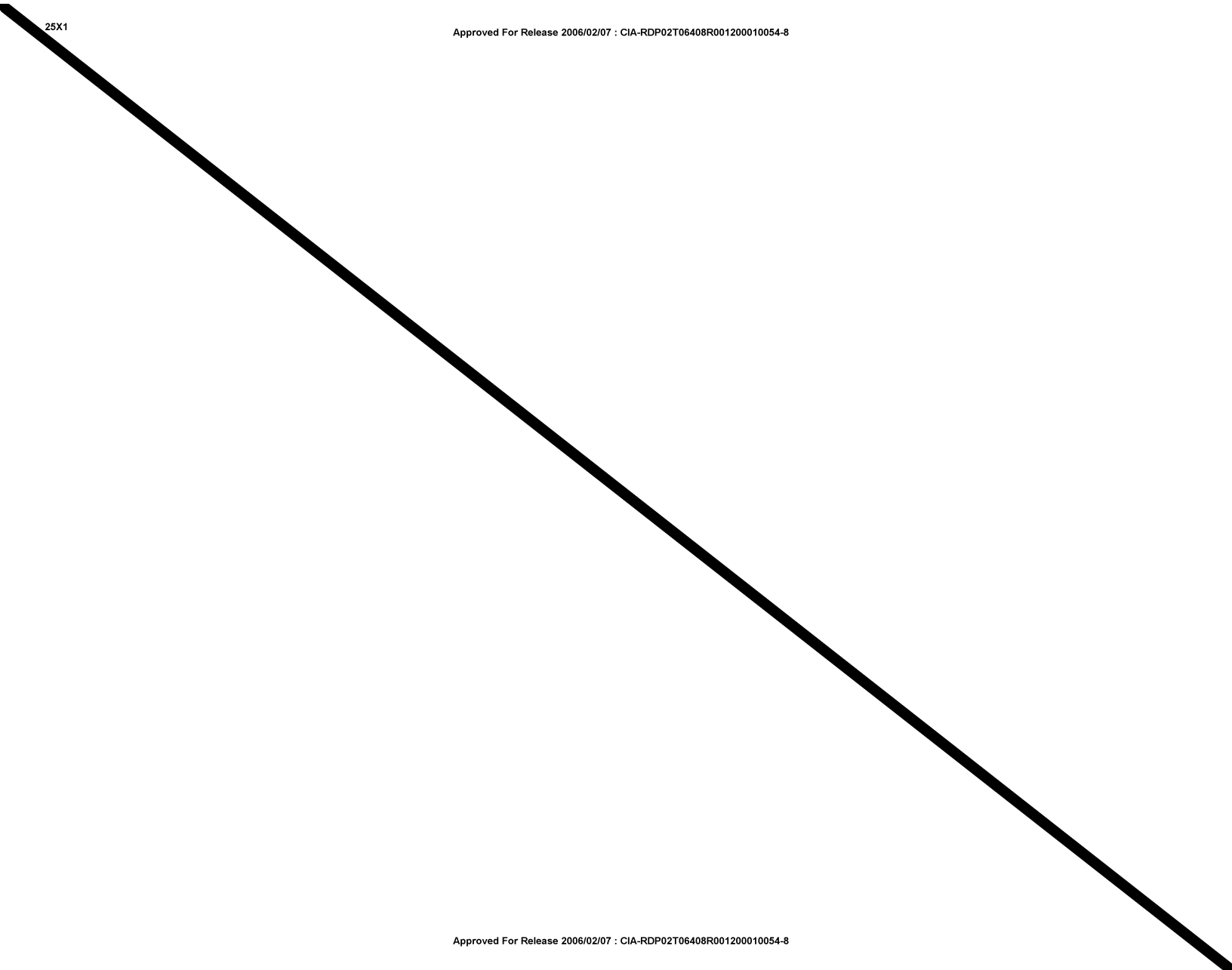

PHOTOGRAPHIC INTERPRETATION REPORT

ZAOZERNYY ATOMIC ENERGY COMPLEX
ZAOZERNYY, USSR

NOVEMBER 1966

NATIONAL PHOTOGRAPHIC INTERPRETATION CENTER

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LIST OF ILLUSTRATIONS

SUMMARY

This report is a partial answer to a standing requirement (JAEIC 15, 20 April 1966) for an annual update of data based on photography covering [redacted] It specifically considers changes that have occurred at the Zaozernyy Atomic Energy Complex between [redacted] which have been observed on all available photographic coverage of the complex since [redacted] such as new construction activity, powerplant expansion, and changes and additions to the electric power facilities serving the complex.

INTRODUCTION

Construction and expansion of the facilities which comprise the Zaozernyy Atomic Energy Complex (56-06N 094-31E), have continued since last reported in detail from photographic coverage of [redacted] (Figure 1). 1/ 2/ The excellent [redacted] photography from [redacted] supplemented by [redacted] reveals considerable activity in progress in Areas 1 to 4 of the complex (Figures 2 and 3). [redacted]

[redacted]

Major changes that have occurred in the various areas of the complex between [redacted] are as follows:

Area 1. Construction of Section 3 of the onsite thermal powerplant continues, and changes to the power circuits leaving the powerplant have occurred. Two areas of housing have been razed.

Area 2. Construction of Cascade Building D is nearing completion and other new construction is observed in progress. Installation of electric equipment continues in Kamala Substation with revisions to circuitry in the area of the complex.

Area 3. A 33-percent expansion of apartment house building in Ust-Barga has occurred, and new construction activity suggests an expansion of the facilities of the probable research installation.

Area 4. Although no significant change has occurred since [redacted] considerable activity is evident and expansion of

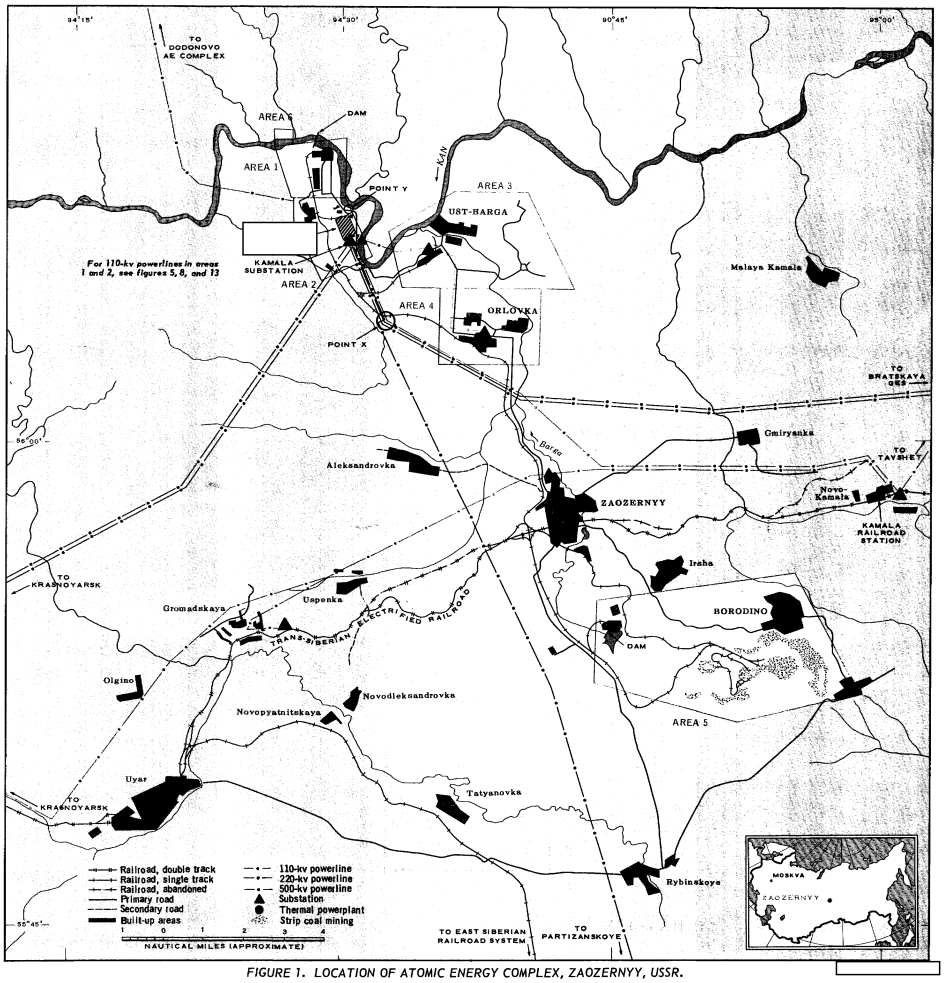


FIGURE 1. LOCATION OF ATOMIC ENERGY COMPLEX, ZAOZERNYY, USSR.

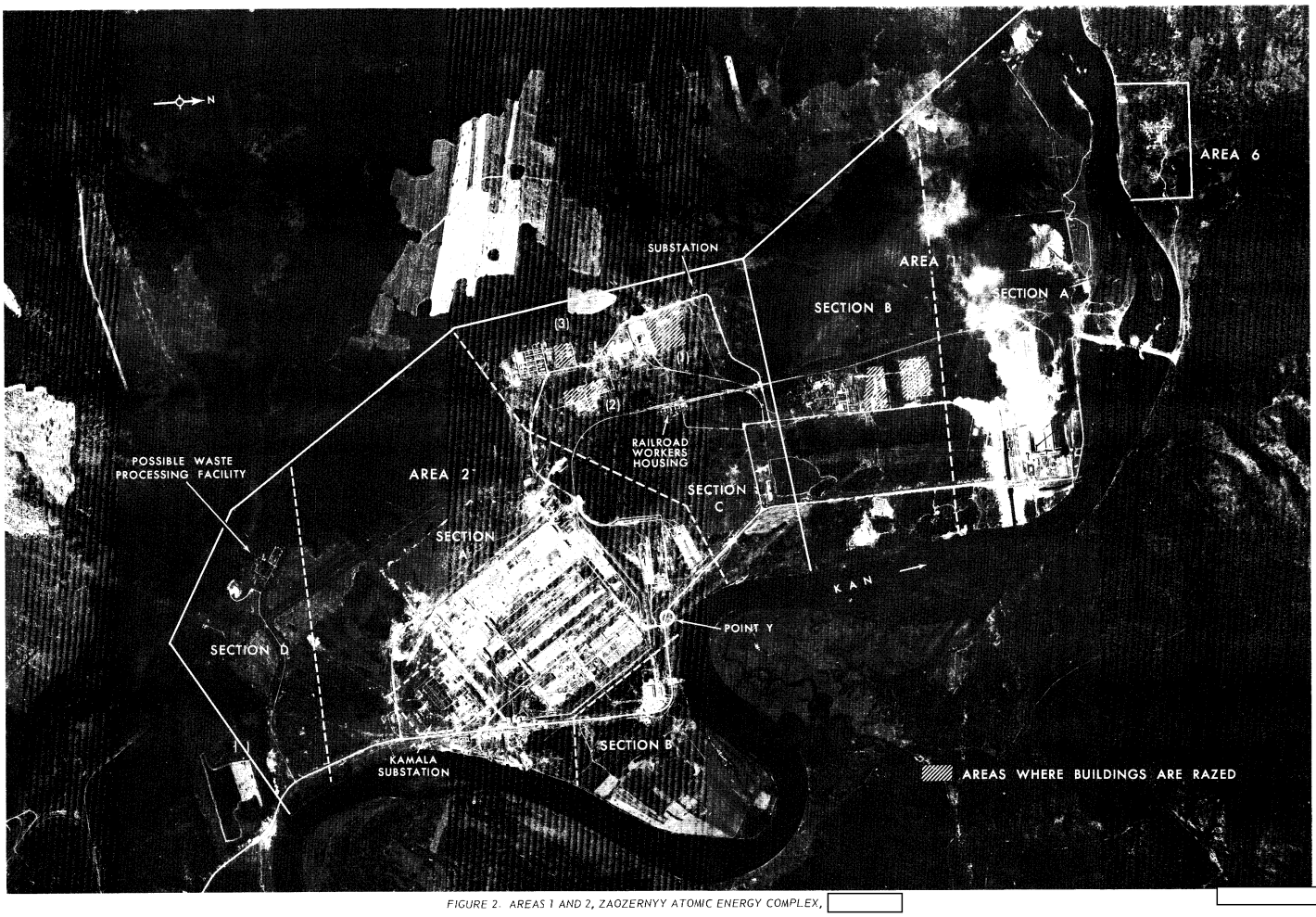


FIGURE 2. AREAS 1 AND 2, ZAOZERNYY ATOMIC ENERGY COMPLEX,

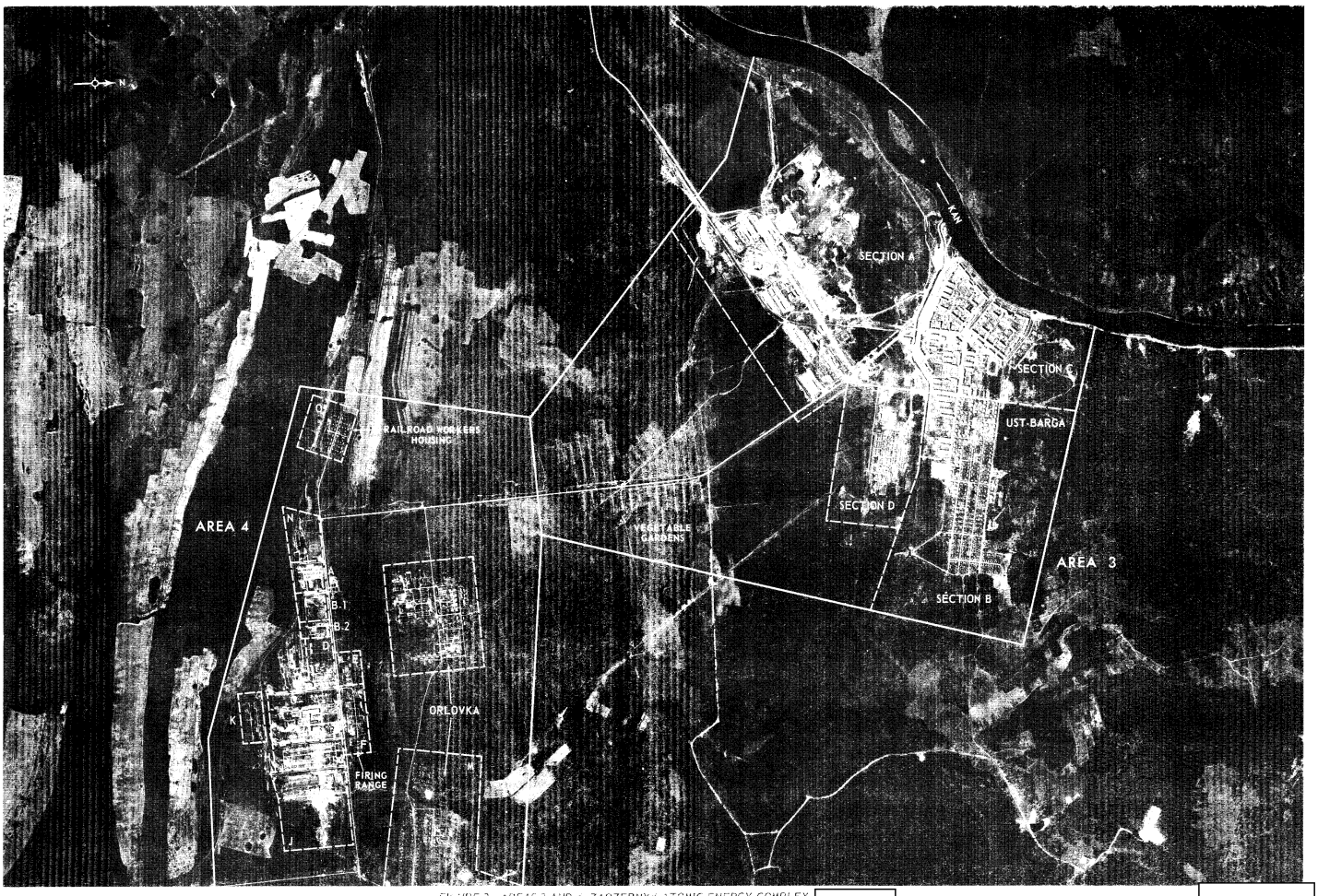


FIGURE 3 - AREAS 3 AND 4, ZAOZERNYY ATOMIC ENERGY COMPLEX.

some facilities has occurred. However, the eastern half of the area has now been covered by photography for the first time, permitting clarification of details previously not determinable from photography. Identifications of some facilities have therefore been modified or clarified.

Area 5. Coal mining continues south of Borodino. This area has not as yet been covered by photography.

Area 6. Photography of reveals that a secured housing area on the right bank of the Kan River northwest of Irshcha-Borodino Thermal Powerplant (TETS) in Area 1 is associated with the complex and probably houses high-ranking personnel.

AREA 1

The northernmost portion of the complex, Area 1, comprises 2 sections; Section A is the more significant because it contains the onsite thermal powerplant which serves the complex.

SECTION A (THERMAL POWERPLANT)

Many details of the onsite powerplant (Zaozernyy Thermal Powerplant, 094-29E; Russian designation: Irshcha-Borodino TETS) were revealed for the first time by the photography of (Figures 4 and 5). Descriptions of structures at the onsite thermal powerplant are presented in Table 1. Construction of Section 3 of the powerplant continues. Laying of footings and other foundation activity are visible; the foundation for the third stack observed in has been backfilled, and construction of the stack, which has a inside diameter and a outside diameter near the base, has commenced.

Table 1. Descriptions of Structures at Onsite Thermal Powerplant (Area 1) Zaozernyy Atomic Energy Complex (Item numbers appear in Figure 5).

Item No	Description	Dimensions in Feet
1	Generator Hall	
2	Coal Feed Bay	
3	Boilerhouse	
4	Stacks (2) and flues	
5	Conveyer system for coal	
6	Coal car unloading bldg	
7	Maintenance and repair bldg	
7A	Unidentified bldg u/c	
8	Poss coal (or briquette) pulverizing bldg	
9	Pumping stations (3)	
10	Prob boiler water treatment plant and storage facility	
11	Administration bldg	
12	Security bldgs	
13	Liquid storage tanks	
14	Revetted oil tanks	
15	Transformer oil storage tanks	
16	Valvehouse for steamlines, with poss blow-off stack	

Mensuration of the construction activities in Section 3 indicates that the probable width of the generator hall from center to center of columns will be and the length, 145 meters

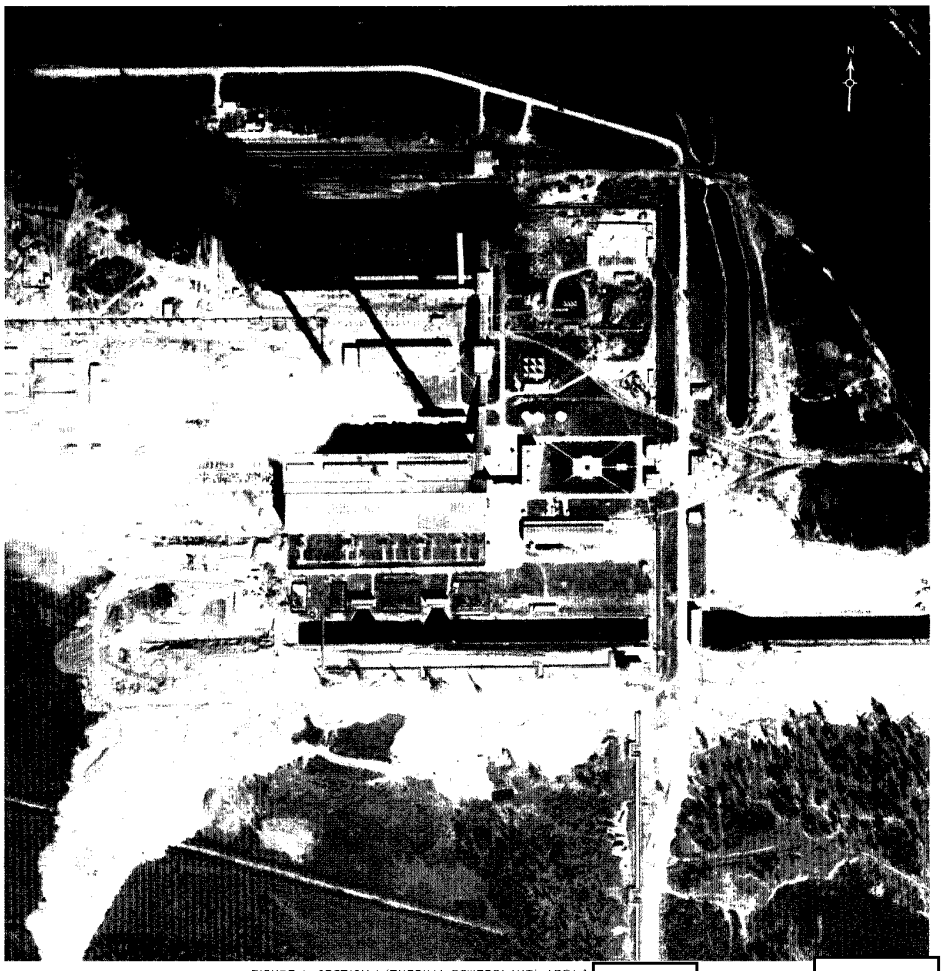


FIGURE 4. SECTION A (THERMAL POWERPLANT), AREA 1,

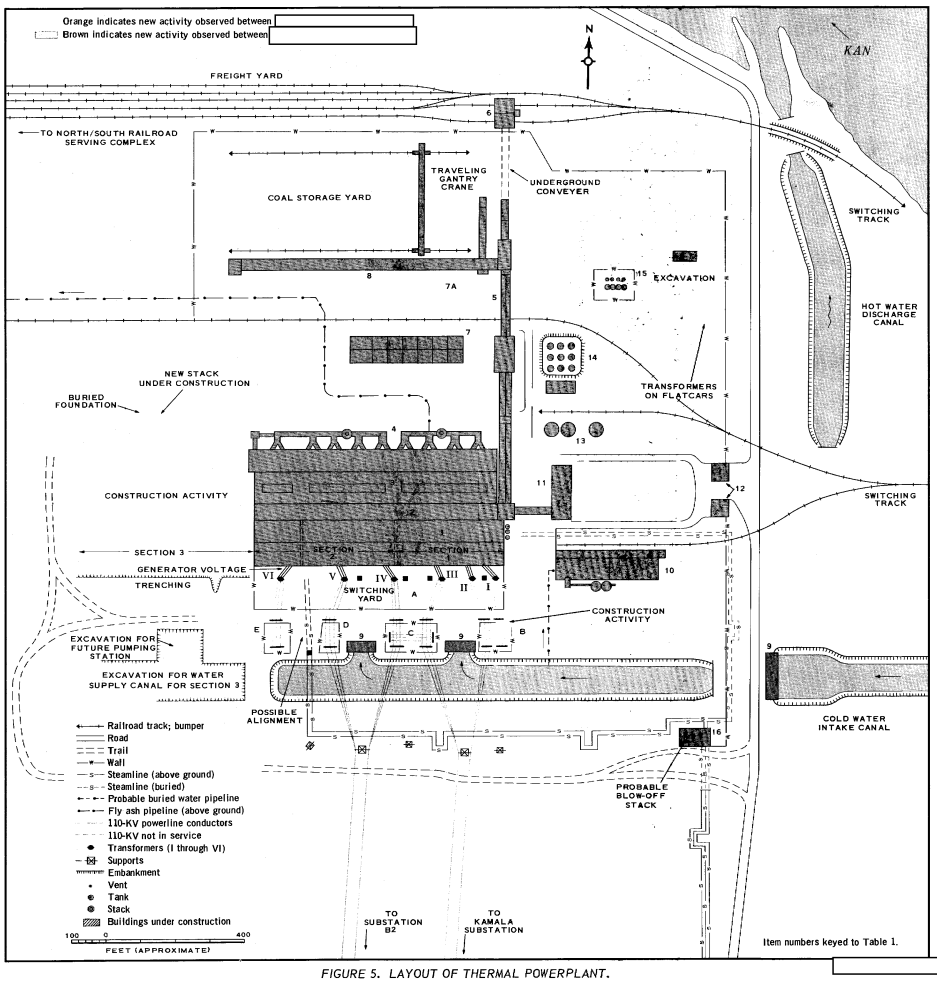
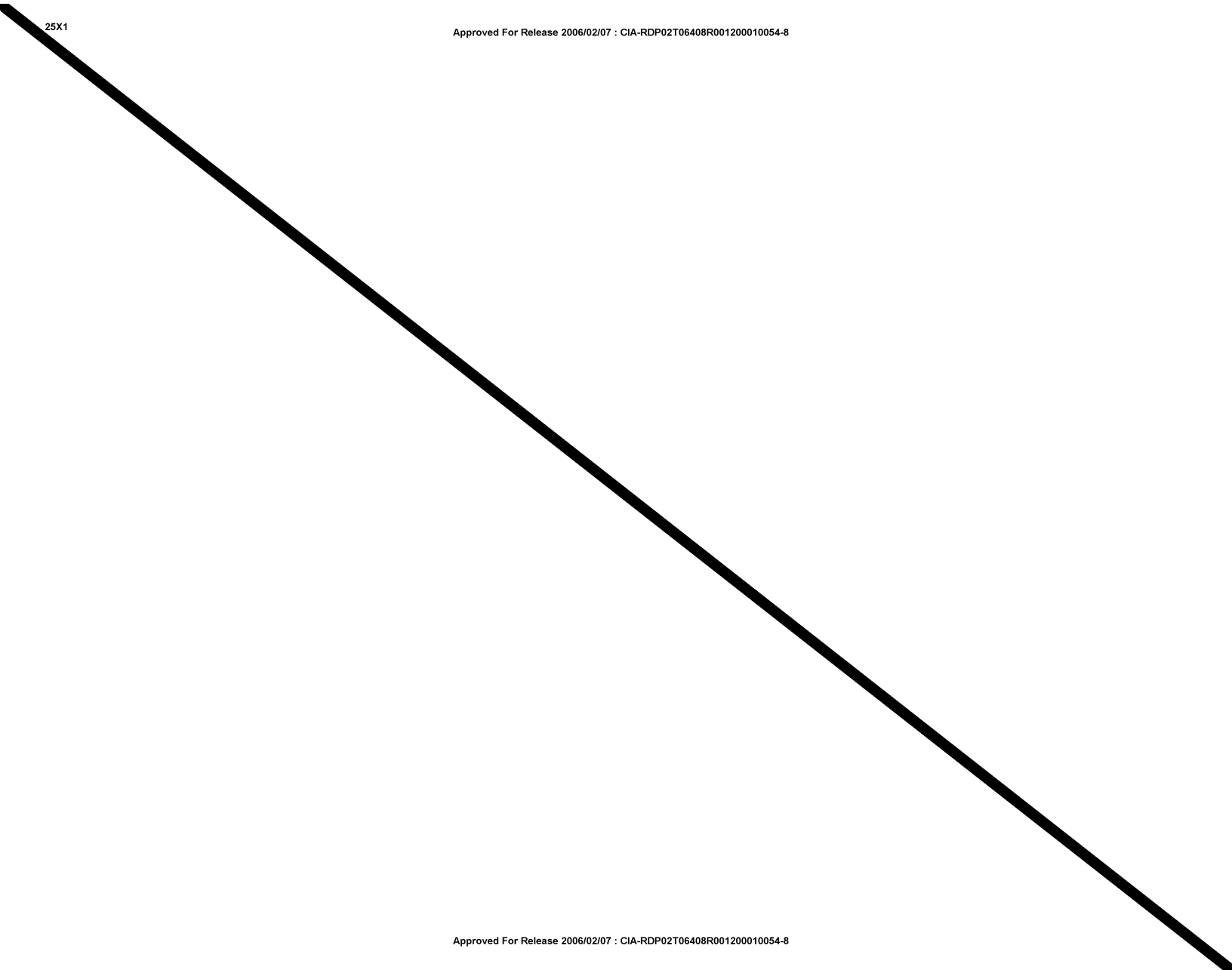


FIGURE 5. LAYOUT OF THERMAL POWERPLANT.

(475 feet). The arrangement of footings and columns for the boilerhouse and its equipment in addition to the generator hall indicates that the cross section of Section 3 may be similar to USSR design PVK-200 + 640 3/ for a thermal powerplant having 200-megawatt (mw) turbogenerators. The length of construction activities observed in [redacted] indicates that there will be about 22 bays at [redacted] on centers ([redacted] in the generator hall which are sufficient to permit the installation of 3 turbogenerators. Three such turbogenerators in the generator hall would require 6 boilers in the boilerhouse. The [redacted] photography reveals a foundation trench for the west wall of Section 3, indicating that no further expansion westward was planned at that time.

Sections 1 and 2 of the powerplant together have 6 turbogenerators, there being six 110/GV*, 3-phase transformers I through VI positioned adjacent to the south wall of the generator hall in the rail-served switching yard A. Two flatcars, each with a transformer body (possibly intended for transformers VII and VIII), are being held at the end of a storage siding east of the coal conveyers (Figures 4 and 5). The presence of these 2 transformer bodies may be an indication that at least 2 turbogenerators will be installed in Section 3. Observable details of installations in the unusual configurations of switching yards B, C, D and E do not reveal the existence of a common bus which could serve all 110-kilovolt (kv) circuits leaving transformers I through VI. A short bus is probably located in switching yard C which serves to switch power coming from transformers III and IV. It is also evident from the [redacted] photography that only 4 of a potential 7 outgoing 110-kv circuits are in existence. Five powerline supports are clearly visible along the south bank of the powerplant's intake canal. The easternmost support is designed to carry only one circuit. Because there were no indications of insulator garlands hanging from the crossarms of this support in [redacted] it can be assumed that no 110-kv power is being transmitted from transformer I. Also, there is no discernible evidence of any powerline supports or of conductors for a single-circuit powerline which might be tied to this support. Transformer I receives generator voltage from turbogenerator 1. It is smaller than the remaining five and if it is a 3-winding transformer 100/GV/10.6-kv (or 6-kv), it could be providing the necessary power for plant use while being temporarily (or possibly permanently) disconnected from the local 110-kv grid. The next support to the west carries 2 circuits, one from transformer II and the other from the short bus in switching yard C. This is the northern terminal support for visible conductors and their supports for a 2-circuit powerline tying the powerplant to the third and fourth switching positions in switching yard C at Kamala Substation. Exactly what electrical connections exist at point Y on this powerline (Figures 1, 2, and 9) is difficult to ascertain from the [redacted] photography. Conductors, apparently recently strung, tie the north ends of the 2 buses in Substation B1 of the [redacted] in Area 2 to a support just west of the powerplant/Kamala Substation powerline at point Y. There is no evidence that the southern of the 2 circuits from

*GV denotes generator voltage which varies according to the capacity and design of a turbogenerator.



Substation B1 is continued east of the above support. Conductors for the northern of the 2 circuits apparently are continued under the 2 circuits of the powerplant/Kamala Substation powerline to a relatively low support east of the powerplant/Kamala Substation powerline. No tie or drop electrical connections at point Y (Figures 6 and 7) can be identified between the powerlines. It does appear possible, however, that some rearrangement of circuits may eventually occur at point Y.

The third support opposite the central switching position in switching yard C is designed for a single circuit. No insulator garlands appear to hang from the crossarms and consequently this support is not in service. No supports for a single-circuit powerline are discernible leading away from this support.

The fourth support carries 2 circuits and is the terminal support for a 2-circuit powerline tying the powerplant to the northern ends of the 2 buses of Substation B2. Conductors for this powerline can clearly be seen.

The fifth support is for a single circuit and the crossarms are set at approximately 45° to the longitudinal axis of the powerplant. Again, no insulator garlands can be observed, nor is there any indication of supports for a single-circuit powerline for which this support would be the powerplant terminus. Consequently, it appears doubtful if turbogenerator 6 was in use in [redacted] The old powerline between Irshcha-Borodino TETS and the Dodonovo area in the vicinity of the powerplant has been abandoned and supports have been removed. Other powerline supports, reported from the [redacted] photography, have apparently also been removed. At this point, it should be noted that the electric power circuitry throughout Areas 1 and 2 of the complex is in a process of change and development and that any analysis of the power situation at the Zaozernyy Atomic Energy Complex is subject to possible major revision in future reviews of any forthcoming photographic coverage of the complex and its facilities.

The [redacted] photography reveals that preliminary construction has begun on a building which will parallel the possible coal-crushing building (Figure 4).

SECTION B (SUPPORT FACILITIES)

Buildings in 2 areas of housing in Section B have been razed since [redacted] or were being razed in [redacted] It appears now that all housing support for those areas of the complex north of the Trans-Siberian Railroad is being concentrated principally in Ust-Barga or in Orlovka, Areas 3 and 4, respectively (Figures 1 and 3). Because heavy construction activity continues at the powerplant in Section A, and because distances between Area 1 and Area 5 of the complex are relatively long, it has been found necessary to provide a large fleet of buses for transporting construction workers from Area 3 to Area 1 now that these housing facilities in Section B are being eliminated.

AREA 2

Area 2 comprises 4 sections. Kamala Substation which is in Section A is described in a separate chapter. The significant section is Section A which contains the [redacted] Plant (Figures 6, 7, and 8). Considerable activity has been observed throughout Area 2 between [redacted] 1). Major construction activity has been observed in Sections A and B. The installation of electrical equipment, especially 220-kv equipment, continues in Kamala Substation.

[redacted]

[redacted]

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Approved For Release 2006/02/07 : CIA-RDP02T06408R001200010054-8

The structure for Cascade Building C northwest of the interconnecting corridor was nearing completion in [redacted] Roof ventilators are not yet installed on the projection for Substation C3 (work on constructing Substations C2 and C3 had not commenced in [redacted] photography reveals that Substation C2 is larger than either C1 or C3 and has 8 roof ventilators for transformers instead of 6. Three more ventilators are on the roof for the control portion. Unidentified structural activity is still underway at the northwest end of Cascade Building C where a crane can be observed (Figure 8). An excavation with a rectangular possible manhole was visible southeast of Substation C3 in [redacted] Figure 8). Three short trenches were also visible at approximately right angles to the southwest wall of Cascade Building C. Other trenching activity was visible at the northwest end of Cascade Building C. The steamline which was being installed parallel to the northeast wall of Cascade Building C in [redacted] 1/ has been completed, and the trenching has been backfilled.

In [redacted] Cascade Building C was not yet joined by interconnecting corridors to Cascade Buildings A and B. [redacted] the interconnecting corridor had been tied into Cascade Building C. Only an excavation indicates, at this time, that the corridor is to be continued to tie eventually into Cascade Building D. However, there is visible in this excavation a concrete configuration which is probably a pipeline control valve manhole which eventually will be part of the basement for an interconnecting corridor (Figures 7 and 8).

Heavy scarring and ground clearing activity southeast of Cascade Building C were evident in [redacted] A month later trenching activity was visible on photography of [redacted] for an extension southeast of the interconnecting corridor; the extension is comparable in size to the main portion of the extension to Cascade Building A (Figure 10).

In [redacted] about two-fifths of the roof for Cascade Building D was in place. 1/ Between [redacted] the the fabric for the main cascade building structure was completed as well as 6 out of 8 wall projections (not including substations) and 4 small projections which may serve as entrances. The remaining 2 wall projections were still under construction and photography of [redacted] revealed the detailed interior wall plan of one of them; the nonsubstation projections apparently will provide offices and other facilities for operating personnel. Substation D1 was in an early stage of construction at the time of the [redacted] photography, and its interior arrangement was visible for the first time (Figure 11). Substation D1 and the other substation projections comprise a small control room at one end and 6 or 8 cells for the installation of 6 or 8 transformers. Only 2 incoming circuits have been seen serving any one of the projection substations. All 3 substations attached to the cascade building in Section F of the [redacted] have 6 roof vents, indicating that 6 transformers have been installed. 4/ Substations A1, A2, and A3 attached to Cascade Building A at Zaozernyy also have 6 roof vents and 6 transformers. However, the [redacted] photography reveals that Substations C2 (completed) probably

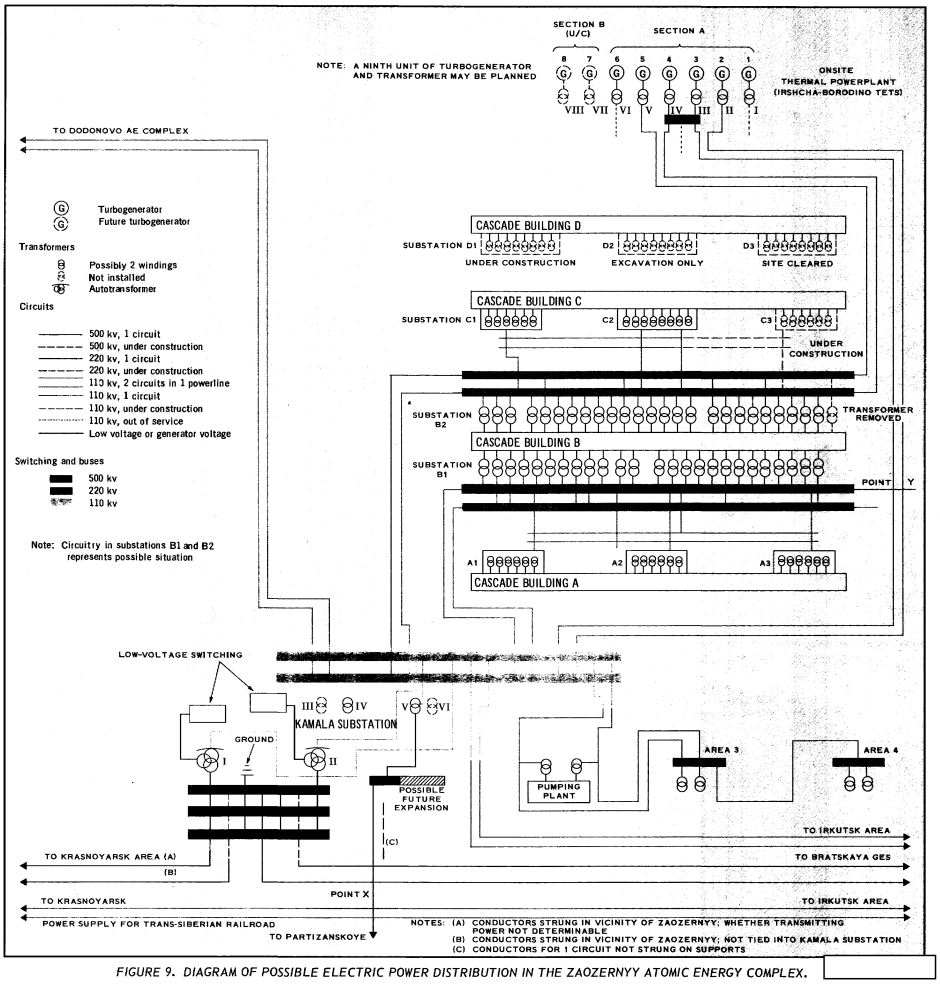

FIGURE 9. DIAGRAM OF POSSIBLE ELECTRIC POWER DISTRIBUTION IN THE ZAOZERNYY ATOMIC ENERGY COMPLEX.

houses 8 transformers and that Substation D1 (under construction) will probably house 8 transformers. Substation C2 has 8 ventilators (Figure 8); Substation D1 has 8 heavy foundations (for transformers) each measuring (Figure 11). The foundations at Substation D1 are separated by about . Assuming that a one-foot reinforced-concrete blast wall exists between transformer niches, a net open width of feet for installing a transformer is available. Allowing for access passage around the transformers, it is estimated that standard 3-phase 110/low voltage (LV) transformers having capacities of 5.6, 7.5, 10, 15, or 20 Mva could be installed. The excavations for future Substations D2 and D3 are large enough to permit construction of projections similar in size to Substation D1; these projections could house 8 similar transformers in both instances.

Considerable trenching activity is visible between Cascade Buildings C and D, including one lengthwise trench about midway between the 2 buildings which was extended between and (Figures 6 and 13). As there are apparently no provisions for expansion loops, this trench is probably for process or water coolant piping.

It is now evident that installation of equipment in the group of 4 buildings for the between Cascade Buildings B and C was probably not completed internally in 1/ Externally, some trenching was evident in their immediate vicinity. Recent photography reveals that aboveground piping was added, interconnecting all 4 buildings between A similar facility is evident at the at the Angarsk Atomic Energy Complex. 5/ The facility is also connected by a corridor or pipe gallery to the building which is part of the interconnecting corridor between Cascade Buildings B and C. The corridor/pipe gallery extends southward to a possible processing building parallel to the main interconnecting corridor. This building, now completed, was under construction in 1/ An irregular pattern of small vents is observed on its roof.

is now enclosed within unusual security measures consisting of an inner wall separated by from 4 outer parallel fences apart (Figures 7 and 8) on the southeast and southwest perimeters. On the northwest and northeast sides the wall is between 1 outer and 3 inner fences. A line of poles along one fence suggests that this perimeter security may either be illuminated at night or electrified, or both. The principal road entrance is at the southeast corner of Area 2. In a guardhouse nd an entrance security control structure 80 feet square were located at the entrance. At that time, an L-shaped building north of these 2 buildings was reported under construction. 1/ This building was complete in and is probably an administration/laboratory building. The base, parallel to the main complex highway, is 4 stories high and measures feet; the leg measures feet and is lower. The L-shaped building is similar to administration/laboratory buildings at some US installations. A large parking area is associated with this entrance facility. Photography of revealed that 49 vehicles were parked in the area; photography of , which was obtained early in the morning, revealed the presence of only 3 vehicles in the area. A building at the northwest end of the parking area measures feet and is possibly for automotive servicing.

The northeast corner of Section A comprises a large secured storage facility which is both road and rail served (Figures 6 and 7). It is divided into 2 separately secured portions, a and b. The larger portion, a, is filled with a great quantity of crates of all sizes and shapes and contains 3 warehouses and a traveling gantry crane. One of the buildings has 2 internal railroad tracks, and a second probably has an unloading platform along one side wall. The smaller portion, b, is specially secured and is a drum-receiving and storage facility similar to those observed recently at the Angarsk and Tomsk Atomic Energy Complexes. The drums range from in diameter. Portion b contains a rail-served probable transloading/warehouse building and 2 shedlike storage facilities with removable roof panels. A number of panels were removed in revealing some stored drums; in some of these openings drums had been removed. Other drums are stored in the open. A string of 8 railroad cars were observed on one of the 2 spurs entering portion b outside its security wall.

Two rail-and road-served areas of activity north of the have existed since the plant was first seen on satellite photography (Figure 2). It is now evident that these are for construction and equipment purposes only and apparently do not require special security measures. The southern area is for structural materials purposes. Because most heavy construction associated with the cascade buildings is now completed, little activity is now apparent here. The northern area is probably for nonsensitive equipment transloading and storage. It is filled with crates of many sizes and shapes and includes a traveling gantry crane and a traveling jib crane.

SECTION B (POSSIBLE FEED PROCESSING FACILITY)

The unidentified new facility reported under development in has been expanded (Figures 7 and 8). this facility consisted of 4 buildings in varying stages of construction inside the right angle formed by the main highway of the complex. A fifth building with an adjacent tower feet) and 2 additional small structures are east of the highway.

The principal building (feet) is complete and has at least 17 roof vents. Two smaller buildings not evident in were under construction in The larger of these 2 buildings measures 175 by 70 feet (overall dimensions) and was only partly roofed in Its floor plan suggests that it may serve as a laboratory/processing-type structure. The purpose of the smaller T-shaped building which measures feet (overall dimensions) is not too clear. The presence of trenching associated with both these 2 structures suggest that the T-shaped building is also to be used for processing. The smallest structure is in the northwest corner of the site and is

The photography reveals an open trench between Section B and Part of this trench was backfilled in (Figure 10). The facility is served by a buried steamline which branches off the main north-south steamlines from Irshcha-Borodino TETS.

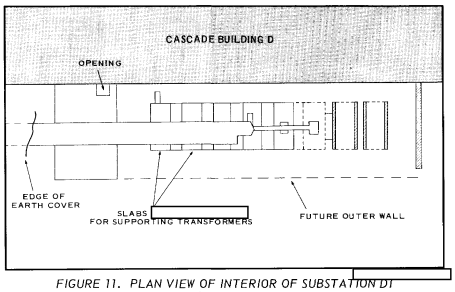

FIGURE 11. PLAN VIEW OF INTERIOR OF SUBSTATION D1 (UNDER CONSTRUCTION).

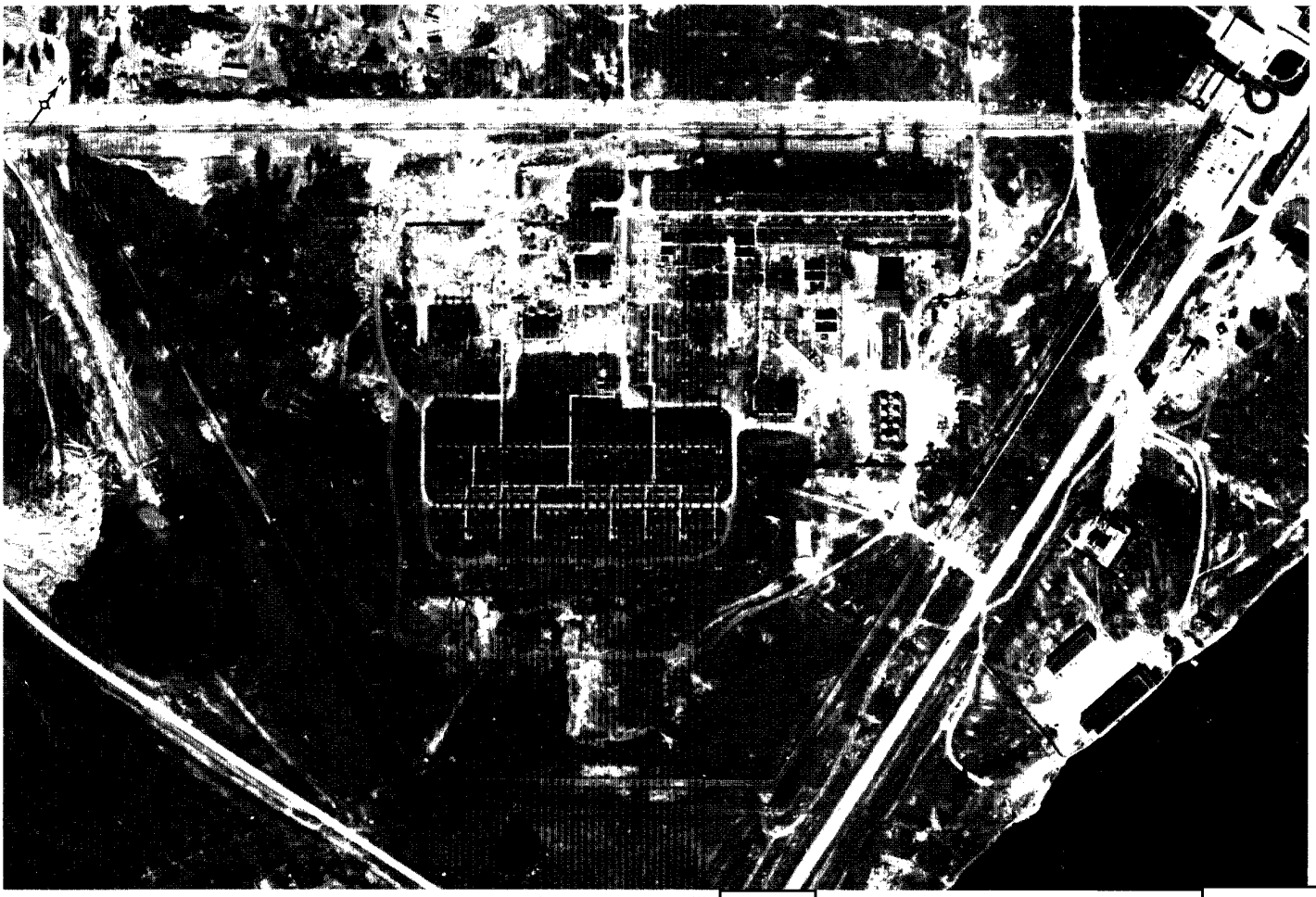

FIGURE 12. KAMALA SUBSTATION,

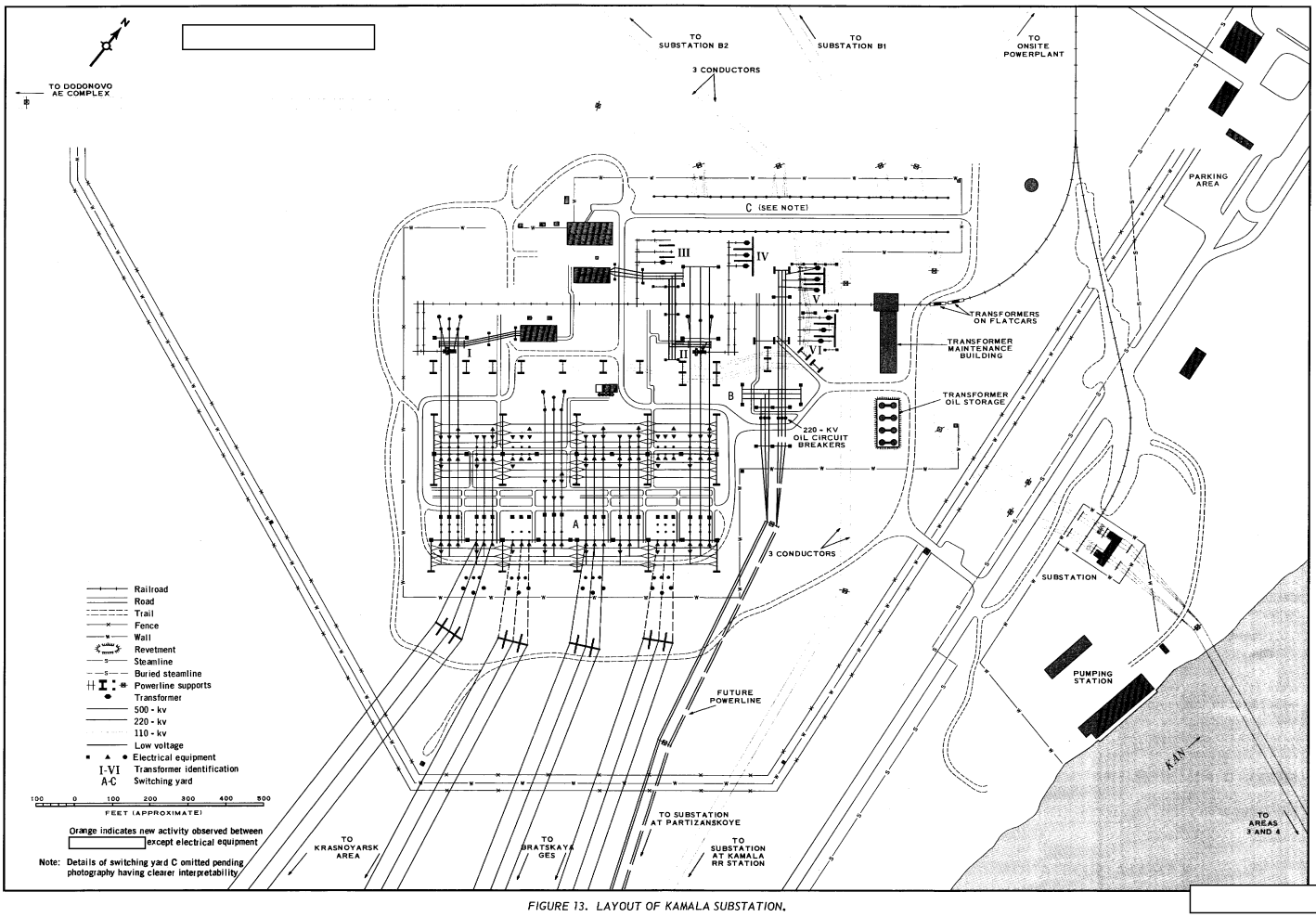

FIGURE 13. LAYOUT OF KAMALA SUBSTATION.

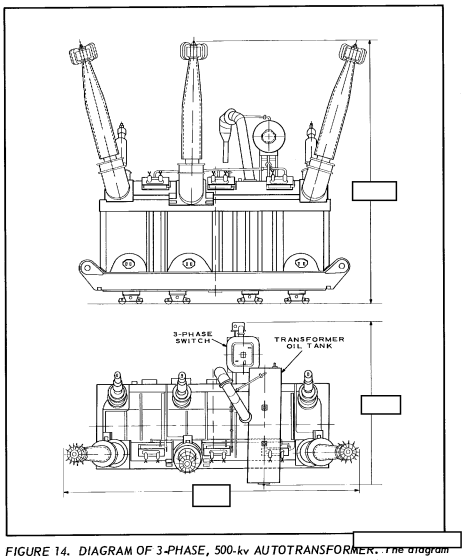

FIGURE 14. DIAGRAM OF 3-PHASE, 500-kv AUTOTRANSFORMER. The diagram was redrawn from an illustration in a Soviet technical publication. 9/

All available photographic evidence suggests that Section B is a feed processing facility which serves the [redacted] but does not require the elaborate security measures for Section A. It possibly handles non-nuclear materials.

SECTION C

The most significant change observed in Section C of Area 2 between [redacted] affects 3 housing support areas (Figure 2). Ten buildings in the northwest area (1) have been razed; in the southeast area (2) 5 buildings have been razed, and one building has had its roof removed. Buildings in a third area (3) have also been razed. It is questionable whether the substation in the northwest corner of Section C remains in service.

SECTION D (POSSIBLE WASTE PROCESSING FACILITY)

No significant change has been observed at the possible waste processing facility since [redacted] (Figure 2).

KAMALA SUBSTATION

Kamala Substation (56-03N 093-20E, [redacted] is one of the major substations of the USSR on the rapidly expanding UHV (ultra-high voltage) grids of 500 kv and higher of the USSR Unified Power System. The substation is tied into the 500-kv grid under development serving central Siberia between Nazarovo and Angarsk. Kamala Substation performs 2 functions: first, it is a switching substation on the Bratsk-Krasnoyarsk-Nazarovo 500-kv dual powerline; secondly, it supplies power as a transformer substation to the [redacted] and other facilities in the Zaozernyy Atomic Energy Complex.

The photography of [redacted] provides interpretability of electrical equipment in the substation (Figures 12 and 13) with an accuracy and definition of detail not available on any previous [redacted] photography of this substation. [redacted] considerable progress took place in the completion of Kamala Substation. However, scarring and other observed activity in the central area and northwest corner, open portions of the uncompleted security fence, and ill-defined alignments of sections of future service roads indicate that more work and some installation of equipment has yet to be accomplished. Temporary 220-kv circuitry for the reception of temporarily reduced voltage of 220-kv over the first of the two 500-kv powerlines between Bratsk and Kamala Substation was apparently removed after [redacted] It is now evident that some 500-kv power from Bratsk is now being delivered to Kamala Substation. Although conductors have been strung on the second powerline in the vicinity of the complex, this powerline was not tied into the 500-kv switching yard A facilities of the substation in [redacted] This is confirmed by the absence of insulator garlands at the substation side of the terminal anchor powerline.

Although conductors have been strung in the vicinity of the complex for both 500-kv powerlines (Figure 13) coming from the Krasnoyarsk area to the west, only one was observed to be tied into switching yard A in [redacted] (Figures 9 and 13). Whether power at 500-kv is being transmitted from the Nazarovo Thermal Powerplant GRES (56-02N 090-20E, [redacted] or not, has not yet been determined from available photography, partly because of the prevailing conditions of smog over the urban area of Krasnoyarsk.

Switching yard A has 8 switching positions and 3 buses (Figure 13). Photography of [redacted] reveals that two 3-phase autotransformers I and II are installed. Mensuration indicates that these are USSR-designed 500/110/10.6-kv autotransformers (Figure 14), each having a capacity of 250-megavolt amperes (Mva). 9/ USSR-published circuit diagrams for Krasnoyarsk GES (hydroelectric powerplant) also indicate that these are autotransformers. 9/ All 3 voltages of both autotransformers appear to be electrically connected. An unusual rail trackage arrangement exists for installing and maintaining these transformers. Instead of being moved into position perpendicularly to one side of the service rail spur, which is normal practice, these transformers had to be moved sideways at right angles on 2 tracks and to a parallel track requiring a second 90° change of direction, before being positioned on short tracks parallel to the spur (Figure 13).

Photography of [redacted] reveals considerable activity affecting 220-kv power at Kamala Substation. It is now evident that there will be in the near future 4 banks of 3 single-phase 220/110-kv transformers III, IV, V, and VI (Figures 12 and 13) installed with protective walls between transformers in all cases. Protective walls also exist on the northeast sides of banks IV, V, and VI. Transformers for banks IV and V are in place and installed, and transformer oil tanks were observed in place. The bodies of the 3 transformers (without external equipment, such as insulators and transformer oil tanks) are being positioned at bank VI. The southernmost transformer body is similarly being positioned at bank III. Two transformer bodies are still on flatcars on the spur east of the Transformer Maintenance Building (Figure 11) apparently waiting to be off-loaded in the maintenance building and then rolled into place at bank III. Whether either transformer bank IV or V is electrically tied into the facilities in Kamala Substation cannot be determined positively from the [redacted] photography. Only 2 switching positions and a short bus section are observed in switching yard B which handles 220-kv power. Although space is available for expansion of switching yard B to the east, only 3 switching positions could be added if normal USSR practice were to be followed. Additional switching positions could possibly be installed if the 8 tanks for transformer oil storage were to be moved to another site outside the security fence alignment observed in [redacted] It is normal and good practice to position Transformer Oil Storage outside the security fence/wall which protects switching yard electrical equipment at substations.

A newly identified 220-kv powerline enters Kamala Substation from the south-southeast. Between the substation and point X (Figures 1, 9, and 15), the powerline supports are for 2 circuits; however, only conductors for the western circuit have been strung. At point X this 220-kv line is carried beneath the two 500-kv powerlines, and supports observed further south are for a single-circuit powerline. This powerline can be traced on [redacted] to a point south of the Trans-Siberian Railroad and west of the town of Zaozernyy; and on [redacted] to a substation at Partizanskoye (55-30N 094-24E, Figure 16). This powerline is probably transmitting 220-kv power to serve the new Abakan-Tayshet rail line which is probably now electrified. Partizanskoye is the southern junction of the interconnecting rail line between Partizanskoye and its junction with the Trans-Siberian Railroad at Uyar.

As observed on [redacted] photography, switching yard C for 110-kv power has 26 switching positions and 2 buses. Eight circuits carried on four 2-circuit powerlines are tied into switching yard C on the north side and two 2-circuit powerlines are tied into the switching yard on the south side. Single-circuit 110-kv tie lines can be traced from transformer banks I and II into switching Yard C.

AREA 3

Expansion of the facilities in Area 3, including the town of Ust-Barga, has continued between [redacted] particularly in Sections C and D (Figures 3 and 17).

POWERLINE SUPPORTS AT POINT X

ITEM	MATERIAL	TYPE OF SUPPORT	VOLTAGE	CIRCUIT S
A	Metal	Line	500 kv	1
B	Metal	Line	500 kv	1
C	Metal	Line	220 kv	2
D	Metal	Angle	110 kv	2
E	Metal	Line	110 kv	2
F	Possibly reinforced concrete	Line	220 kv	1
G	Metal	Angle	220 kv	1
H	Metal	Angle	220 kv*	1

*Item H is a special tower to carry 220-kv power under 500 kv.

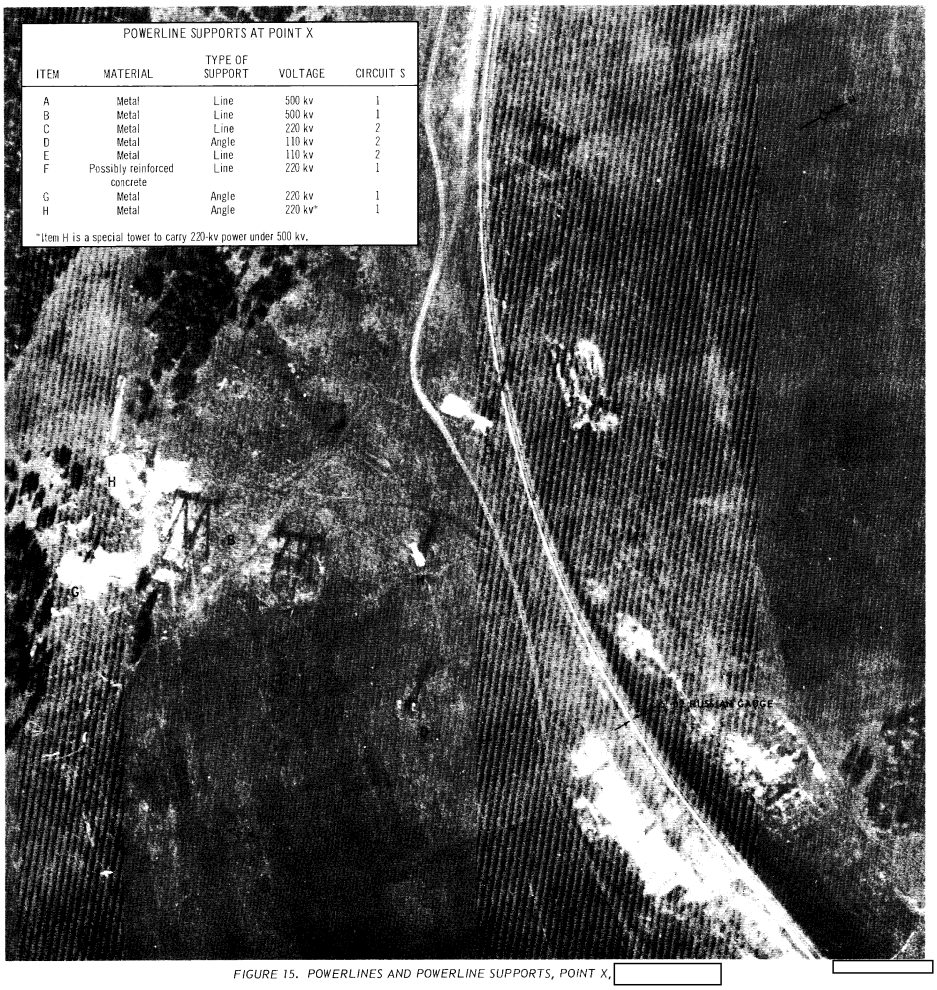

FIGURE 15. POWERLINES AND POWERLINE SUPPORTS, POINT X,

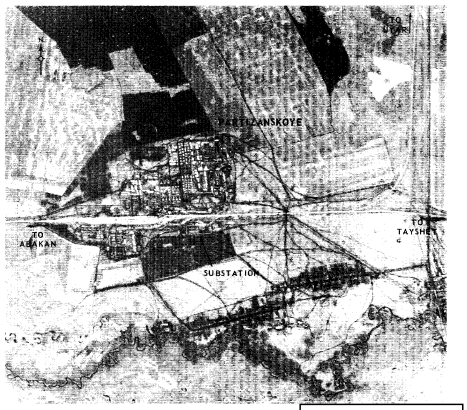

FIGURE 16. PARTIZANSKOYE SUBSTATION,

SECTION A (SUPPORT FACILITIES)

Section A contains various types of support facilities. These are basically associated with construction activities, especially for construction in Area 3, although possibly they may serve to some extent Areas 1 and 2. However, only a few vehicles were observed on the road between Area 3 and Areas 1 and 2 on the photography.

Subsection A1 (Possible Small Parts Structural Fabrication Facility)

No significant change occurred between

Subsection A2 (Cement Batch Plant)

Photography of reveals possible foundations for 2 long warehouse-type structures adjacent to the cement batch plant.

Subsection A3 (Probable Ceramics/Brick Plant)

Foundations for 6 buildings, including 5 possible storage-type buildings, are identified between the south security wall and the railroad spur which serves Area 3 installations.

Subsection A4 (Probable Construction Materials Storage and Assembly Facility)

No significant change has occurred since The steamplant may be on a standby status as of

Subsection A5 (Motor Pool and Maintenance Facility)

A new structure, possibly a garage for small vehicles, has been erected since in the southwest corner of the parking area. In 35 probable buses, the majority of them

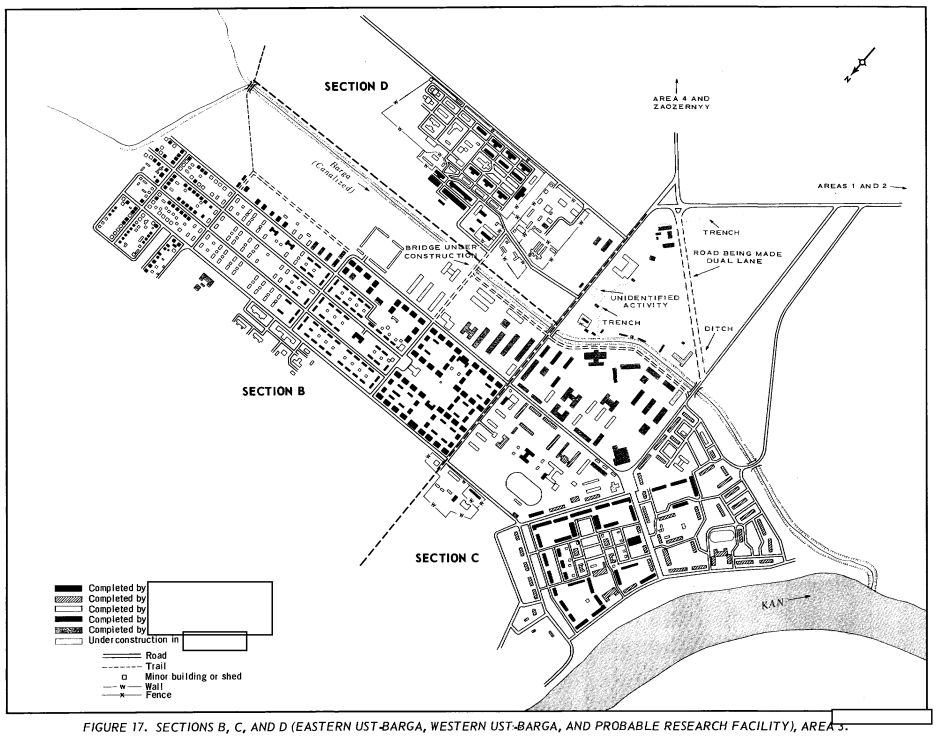

FIGURE 17. SECTIONS B, C, AND D (EASTERN UST-BARGA, WESTERN UST-BARGA, AND PROBABLE RESEARCH FACILITY), AREA 3.

measuring about were parked in the parking area and 2 buses were observed at the entrance gate in the southeast corner of the facility. A number of buses were observed operating in Area 3 and from Area 3 to the railroad station in Zaozernyy. None were observed operating to Areas 1 and 2 on photography of but they were running on into and out of Areas 1 and 2 along the main highway of the complex.

Subsection A6 (Clay Pit)

Except for changes in excavated areas and tailings, no significant change has occurred since

SECTIONS B AND C (UST-BARGA)

Seven small multifamily dwellings, a housing support facility, and possibly a primary grade school have been added to Section B since (Figures 3 and 17).

Fifteen large apartment-type residential structures and 9 residential support facilities, such as schools and stores, have been added to Section C since This expansion includes a previously undeveloped area between Sections B and D. Also observed in were 7 apartment buildings in varying stages of construction and 2 support buildings. Section C contained 100 structures in not including small possible garages). By an additional 33 structures had been added or were under construction, a one-third expansion in 20 months (Figure 17).

SECTION D (PROBABLE RESEARCH FACILITY)

Only 1 small structure has been added within the secured area of this facility. However, in the previously open areas to the west, 5 permanent buildings have been erected and 3 were in varying stages of construction in One of these structures appears to be residential in character. It is too early to determine either their future functions or whether or not they will be incorporated into the probable research facility.

AREA 4

The photography provides the first complete coverage of Area 4, including the most significant Sections E, F, G, H, and K. (Photography of provided coverage only of the western half of Area 4, including a small portion of Section G). Many details of installations in the various sections are now identifiable for the first time (Figures 3, 18, and 19).

SECTION A (MOTOR POOL AND MAINTENANCE SHOPS)

No significant change has occurred in Section A between over 210 trucks and vehicles were parked in Section A, including several truck trailer combinations. Photography of (probably obtained during normal working hours) reveals over 75 trucks and vehicles within the secured compound, 6 being serviced outside the compound, and 1 truck turning into the road leading to the facility.

SECTION B

Section B was divided into 2 Subsections (B1 and B2) on the basis of photography.

Subsection B1 (Materials and Equipment Storage)

Three buildings have been added to Subsection B1 since 2 of these are storage/warehouse-type buildings and the smallest is probably a servicing building for a new secured automotive equipment compound in the northwest corner. Photography of reveals that about 28 pieces of equipment, possibly construction-type vehicles, were parked in this compound. Subsection B1 is served by 2 railroad sidings and has no interconnecting access to Subsection B2, being separated by a wall without apparent openings. Crates and other items in open storage are relatively small and occupy a small percentage of the open area.

Subsection B2 (Probable Fabrication Facility)

No apparent change has taken place in Subsection B2 between The largest building in the subsection has a monitor roof and is probably used for fabrication purposes. A small overhead crane is located south of the building; the crane is on the same longitudinal axis as the building. A traveling tower crane on north-south tracks is east of the probable fabrication building and the gantry crane. A short railroad spur passes under the south ends of the parallel supports for the bridge crane.

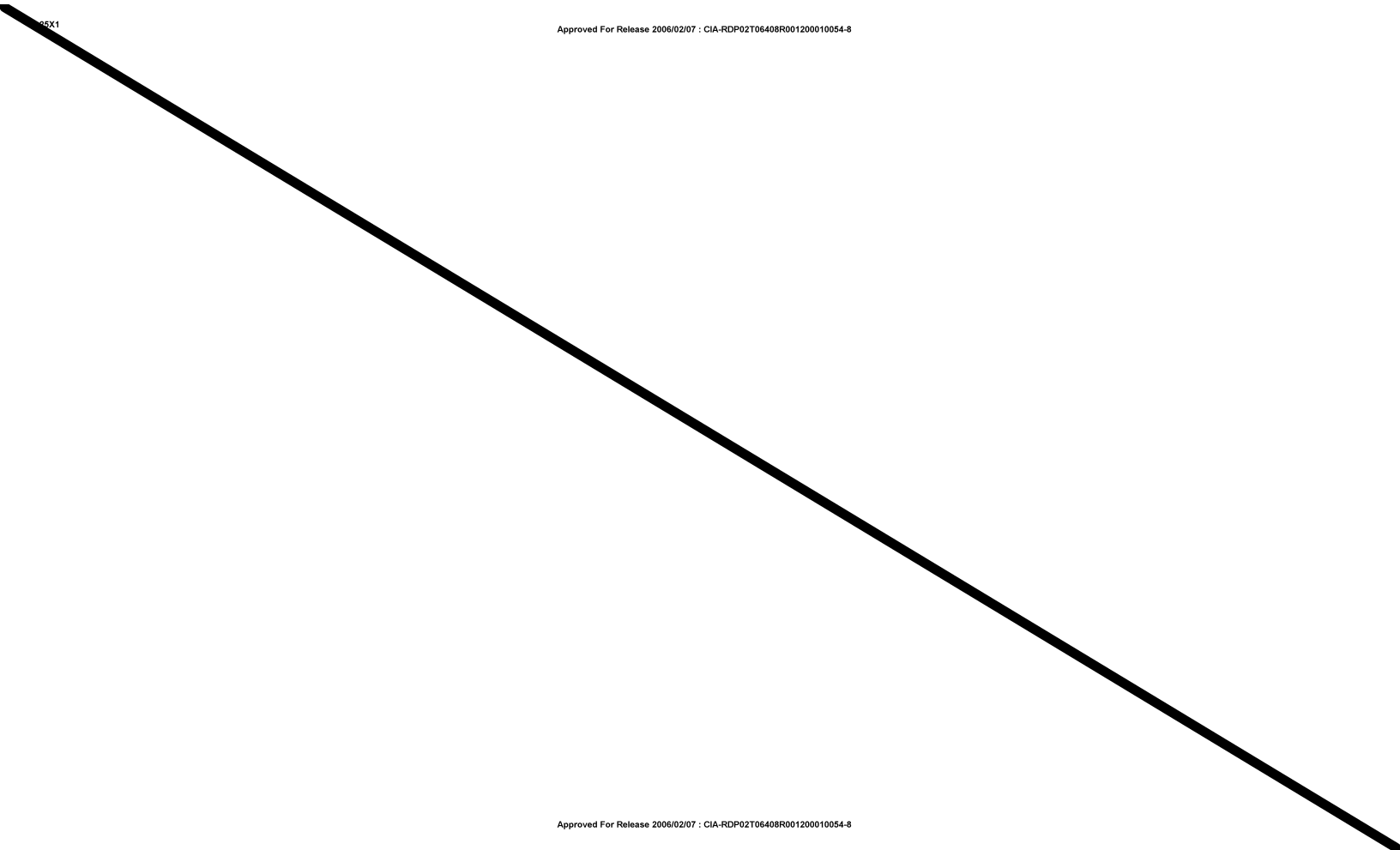

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FIGURE 20. AREA 5,

SECTION C (RAILROAD SHOPS)

The principal maintenance-type building with a monitor roof has been doubled in length eastward between and A traveling tower hammerhead crane is between the 2 rail sidings west of the maintenance-type building. Between this building and the south security fence are 2 sets of 2 parallel rails for traveling gantry cranes. The southernmost pair of rails has 2 cranes; the other pair of rails, shorter in length, has 1 crane. A long-boom, probable caterpillar, crane was observed in east of the principal maintenance shop.

SECTION D (PROBABLE SHOPS AND OPEN AREAS)

The western half of Section D is open and apparently is not being used. A single-lane road from the main highway of the complex leads to an L-shaped hardstand near the southern security fence. No significant change has occurred in the secured eastern half, a Probable Shops Area, since Three small areas within the overall security fence are separately secured.

SECTION E (POSSIBLE TEST/LABORATORY AREA)

No observable change occurred in Section E between Little activity was observable in

SECTION F (POSSIBLE ACADEMIC/PARAMILITARY INSTALLATION)

Section F is a secured area with barracks/dormitories, a messhall/social activity building, possible laboratory/classroom buildings (1 separately secured), and a football (soccer) field at the east end of the section. A possible sunken small arms firing range and scarring for other possible military activity are visible east of the security wall (Figure 3).

SECTION H (PROCESSING/STORAGE FACILITY)

Between the principal changes observed in Section H are the addition of an earth-covered bunker (item 35A, Table 3, and Figure 19) and the addition of a small structure near a probable firehouse/garage (item 34). Considerable material is evident in open storage areas, and 2 traveling tower hammerhead cranes and 1 traveling gantry crane to handle crates and other items were identified.

SECTIONS I AND J (SAWMILL/LUMBER MILL)

Photography of reveals that Sections I and J combined 1/ are actually a single facility for the processing and finishing of lumber required for the extensive building construction activities throughout the complex. East of the sawmill is a large sawdust pile.

SECTION K (STORAGE/TESTING FACILITY)

No identifiable change has occurred inside the 2 secured areas of Section K (Figures 18 and 19) between A rectangular road/rail possible transloading/warehouse building is newly identified on the north side of the rail spur serving Section K outside the security wall.

SECTIONS L AND M (ORLOVKA HOUSING AREAS)

In contrast to the evident expansion of Ust-Barga in Area 3, the 2 housing areas, Sections L and M, comprising Orlovka show no evidence of similar expansion between

SECTION N (FREIGHT HANDLING YARD)

The photography reveals 6 sidings in the freight handling yard. The 3 southern sidings are served by a traveling gantry crane. The remaining 3 sidings end in a 5-track team yard at the eastern end of this facility.

Since a 3-track yard has been laid northwest of Section N; a coal pile (probably surplus) is located along the southernmost siding. This yard has a short switching lead at its east end; however, grading has been commenced to extend this lead into the trackage of Section N.

SECTION O (CLASSIFICATION YARD AND RAILROAD WORKERS HOUSING)

The railroad facilities in Section O have been expanded since North of the 6-track yard observed at that time, the main line has been double-tracked for 1 train length on the east side of the former single track, and a storage siding has been added on the west side.

On a steam-drawn train of about 27 coal-filled hoppers/gondolas and 2 empty hoppers were heading in the direction of Area 1 on one of the 6 tracks. A string of miscellaneous railroad cars was on the southernmost track.

Unidentified bulldozing activity is observable south of the railroad and a probable bulldozer is visible. No expansion has occurred in the railroad workers housing area.

AREA 5

Area 5 comprises a large open pit coal mining operation south and southwest of Borodino and about 8 nm southeast of the town of Zaozernyy on the Trans-Siberian Railroad. A north-south railroad connects area 5 to Areas 1 through 4 of the complex north of the Trans-Siberian Railroad. West of the mining activity are a possible rare metals processing plant, a small powerplant with an associated cooling pond, and a housing support area (Figures 1 and 20).

Only photography has been available over Area 5 and therefore determination of details of the operations in this area of the complex are somewhat inconclusive. Coal mining activity continues in the main pit, and there are indications that this pit is possibly being extended to the east.

No apparent change has taken place at the possible rare metals plant and associated small thermal powerplant since details of which cannot be interpreted at this time.

AREA 6

Recent photography of the complex indicates that a secured area on the right bank of the Kan River northwest of Irshcha-Borodino TETS (Figures 1, 2, and 21) is associated with the complex and is now designated as Area 6. Within the security fence are 6 research/laboratory/classroom-type buildings set diagonally on both sides of a central landscaped mall, a T-shaped community hall/messhall at the north end of the mall, 4 (and possibly 5) residential structures possibly for high-ranking personnel, several small service-type buildings, and a parking area.

Outside the security fence is a small sewage disposal plant and groups of small buildings, possibly for service personnel. A steamline from the powerplant provides heat for Area 6.

FIGURE 21. AREA 6,

Table 3. Description, Estimated Function, and Dimensions of Buildings in Sections G and H, Area 4 (Item numbers appear on Figure 19)

Item No	Description/Estimated Function	Dimensions* (ft)	Stories
	SECTION G (Possible Uranium Processing Section)		
1	Secured facility (possibly the substation for Area 4) containing an L-shaped bldg; 5 objects adjacent to bldg may be electrical equipment; western end is 2 or 3 stories high; SW corner of facility separately secured and contains 2 poss transformers, guardhouse with 2 poss tanks; security control bldg in NE corner		1 1 1 1
2	Suspect liquid reagent (acid) blending & control bldg; T-shaped; west end is 2 stories high; east end, 1 story high; 2 warehouse-type bldgs, one located north, the other west of bldg	)	1 2 b) --) --
3	Suspect water supply bldg; irregular; control valves may be in lower portion; hardstands at north & south ends of bldg; newly identified small bldg west of suspect water supply bldg		1 & 2 1
4	Materials open storage and transloading area; road and rail served; 4 parallel overhead crane support tracks at right angles to newly identified track serving bldg 6; traveling gantry crane (h) supported by 2 northernmost tracks; 2 cranes (i and j) on area filled with containers, such as crates of varying sizes and possibly some drums; 2 empty gondola cars observed in area on access track	---	--
5	Poss liquid storage facility; secured; prob guardhouse/control bldg on west side; 1 small probable buried tank & 1 large poss buried tank; space for additional tanks available; steamline parallels southern fenceline; vegetation obscured previous evidence of tanks		1
6		)	2 --
7	Poss acid storage or processing retorts (8); rail served; vertical & cylindrical; 4 on each side of rectangular structure; connected by overhead piping; similar structures in Chemical Processing Areas, Tomsk & Kyshtym Atomic Energy Complexes, & SW of Section E, rectangular structure connected to long narrow bldg; 2 boxcars on siding	---	--
8	Poss control bldg with 3-level stepped roof; connected by suspect pipeline to long narrow bldg (item 7)	---	--
9	Prob material dump with conveyer/material-handling bldg; materials to be processed form a pile on either side of handling structure; 3 boxcars on siding serving conveyer system,	---	--
10	Poss water supply control bldg; 2 roof vents		1
11	Poss processing bldg; low rectangular structure; roof much lighter than those of nearby structures; connected by suspect pipeline to item 19; pipeline passes through small newly identified bldg between items 12 and 18		Prob 2
12	Poss processing bldg; T-shaped with an L-shaped higher portion on stem; suspect control section in north end; suspect precipitation processing in eastern half; suspect filtration processing in NW part; suspect lab in SW corner; 12 roof vents on L-shaped roof; connected by 2 suspect pipelines to item 18; suspect connection to suspect pipeline connecting items 11 & 19		1 1 & 2
13	Poss processing (leaching) bldg; low pitched roof; 2 rows of prob drums stored between items 12 & 13, observed no longer present; suspect pipelines to items 14 & 15		1
14	Suspect processing/control bldg; rectangular; 4 roof vents; connected to items 13 & 17 by suspect pipelines		1
15	Prob chemical processing bldg; irregularly shaped; rail unloading facility NE of bldg with conveyer system at north end of bldg; 2 stacks 150 ft high on west side probably for venting; stacks discharging light smoke on some photography; underground flues to main bldg; road loading/unloading tower NW of bldg connected to conveyer system; at least 7 vents on roof of bldg; suspect pipeline to item 13; suspect underground pipeline to item 16; 4 vertical tanks/chemical processing equipment with interconnecting aboveground pipes to main bldg		--
16	3 vertical tanks with small bldg and overhead piping; 1 tank added since	---	--
17	Suspect chemical storage/equipment; 3 vertical tanks on suspect pipeline connecting items 14 & 16 observed now covered by bldg	---	1
18	Poss processing bldg; T-shaped; bar of T taller than stem; rail served; bar has low arcuate roof; roof vents on stem of T; rail spur passes through west end of bar; 2 freight cars & 1 gondola car on siding north of bldg; low extension at south end of stem possibly vehicular loading/unloading platform; railroad track west of bldg; connected by 2 suspect pipelines to item 12; equipment and crate storage area north of bldg with 2 cranes; one of which is traveling tower hammerhead crane (k)		2 1
19	Poss processing/storage bldg; rail served; walled open storage area south of bldg; traveling crane (f); connected by suspect pipeline to item 11; 2 gondola cars on siding		Prob 2
20	Suspect control valve bldg; 2 low roof vents		1
21	Poss packaging/processing bldg; T-shaped; 2 roof vents; has road transloading capability; walled open storage north of bldg between items 21 and 19	(bar) (stem)	1 1
22	Poss security/administration bldg; rectangular; near rail entrance to Section G; storage area south of bldg with traveling tower hammerhead crane (g)		1
23	Poss processing/fabrication bldg; connected by suspect u/g pipeline to bldg 18		1
24	Poss fabrication bldg; has low arcuate roof		1
25	Poss fabrication/maintenance shop; second largest bldg in Section G; irregularly shaped; tower structure at north end		2
26	Railroad transloading yard; possibly used for handling bulk & other equipment; apparently not used for handling & assembly of structural materials; 2 sidings; 2 traveling gantry cranes (b, c); b is heavy duty with A-frame supports; 2 traveling tower hammerhead cranes (d, e); previously reported crane (a) no longer visible; 1/ crates, piping (including large diam prefabricated pipe section stored vertically and on 5 freight cars) and other equipment in storage; 4 standards for floodlighting	---	--
27	Suspect water supply bldg; rectangular; control valves in low portion; 4 vertical cylinders along east wall		1 & 2
28	Poss pumping plant; rectangular high portion at SW corner; 3 poss roof vents; metal stack removed and replaced with new bldg having tower at western portion		-- --
29	Of the 2 previously reported buried tanks, 1/ scarring for 1 is evident SW of bldg 27; poss valve control bldg with 2 roof vents built on site of 2d buried tank		1
30	Tank (half buried); suspect water supply		
31	Poss admin bldg; rectangular		Prob 1
31A	Poss small laboratory-type bldg u/c; scarring activity north of bldg 28 may be preparatory to new construction activity		At least 1
	SECTION H (Processing/Storage Section)		
32	Poss admin bldg; rectangular; poss chimney or rectangular vent near SW corner		At least 1
33	Poss security bldg; rectangular		At least 1
34	Prob firehouse/garage; rectangular; 4 roof vents; small bldg added SE of prob firehouse/garage since		1 1
35	Warehouses (5); possibly for transloading & handling of special items including those of nuclear significance; rail served; similar structures at Verkh-Neyvinskiy, Tomsk, and Angarsk; 4/ 6/ 5/ a traveling tower hammerhead crane (l) serves 3 southernmost bldgs		1
35A	Large newly identified earth-covered bunker; entrance to entrance, about 200 feet	---	1
36	Poss vehicular servicing bldg; rectangular; situated on vehicular apron or hardstand		1
37	Poss transloading & storage/fabrication bldg; possibly for storing heavy items; rectangular; rail siding on west side; traveling tower hammerhead crane (n) between rail siding & road; platform with stored possible drums on top is north of bldg		1 --
38	Poss transloading & storage/fabrication bldg; narrow & rectangular; possibly used for storing small items; 2 vehicle entrances on west side; rail served		1
39	Poss transloading & storage/fabrication bldg; rectangular; road & rail served		1
40	Poss transloading & storage/fabrication bldg; narrow & rectangular; possibly used for storing small items; 3 vehicle entrances on east side; rail served; 3 roof vents; small bldg south of item 40; 2 entrances on west side; 1 on east side; small L-shaped shed further south		4 1
41	Poss transloading & storage/fabrication bldgs (2); rectangular; 2 vehicle entrances on west side of each bldg; rail served; 2d platform (see item 3) is west of south bldg		1
42	Prob warehouse; rectangular; NW of prob warehouse is small bldg		1 1
43	Prob warehouse/storage bldg; rectangular; 2 vehicular entrances on east side		1 or 2
44	Large road/rail served open storage area inside west side of secured area for Section H; traveling gantry crane (m) handles crates of many sizes and shapes; prob piping	---	--

*Dimensions given are those of items underlined in Column 2; overall dimensions are given for irregularly shaped buildings.

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REQUIREMENT

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NPIC PROJECT

11572/66 (partial answer)

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